South Carolina State-Scale Estuarine Statistical Survey and the NARS National Coastal Condition Assessment

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South Carolina Questions

- SC state-scale survey effort began 2000, EMAP era, prior to NARS
- What are the state-scale conditions for the water resource for each waterbody type (§305(b), all waters)?
  - Aquatic Life Use
  - Recreational Use
- What are the main causes of impairment (stressors, determined by size or % of resource impacted)?
- Do the individual sites meet State Standards (§303(d) list)?

Resource Types Assessed Using Statistical Survey Approach

- Streams
- Lakes
- Estuaries

Original Intent

- Reliable state-scale WQ condition estimates for §305(b)
- Monitoring of survey sites should conform with the Department's §303(d) assessment methodology
  - Individual sites can be assessed for potential inclusion on the §303(d) list of impaired waters
- And data could be used for permits and modeling

In order to do that, **sufficient data** must be collected at **each** Survey Site to apply SCDHEC's §303(d) Assessment Methodology

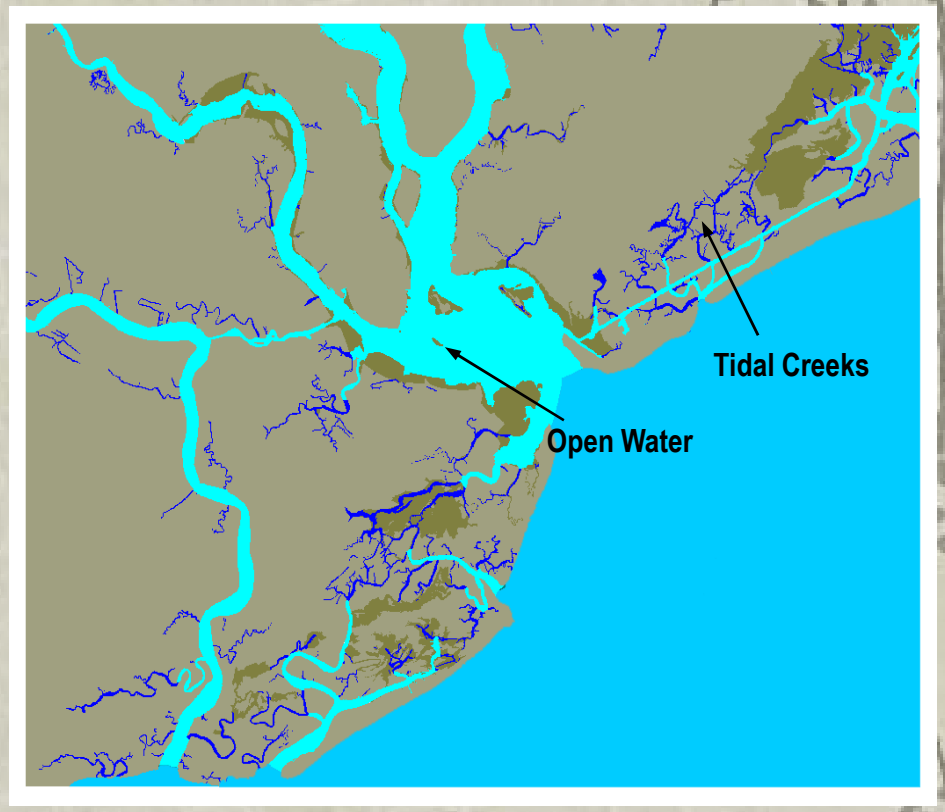
- Monthly sampling for 1 year at all survey sites
- Same parameter suite as our fixed monitoring sites
- This is a little different approach than NARS and most other states with state-scale statistically-valid designs

Statistical Magic

- It requires around 50 to 60 sites to make a population statement 90% ± 10% confidence
- We sample 30 sites per year
- We compile 5 years of data to make a statewide statement

Targeted Categories for Probability-Based Sites

- **Estuaries**
- 30 sites per year
- Sampled monthly
  - Two distinct strata:
    - 15 Open water (> 100 m wide)
    - 15 Tide Creeks (< 100 m wide)



2010 NARS National Coastal Condition Assessment

- Head-of-salt to confluence w/ocean
- For SC, Delaware Bay, Chesapeake Bay, & Puget Sound, the NCCA sample frame was replaced by organization-specific GIS layers
- Unequal weight categories within individual major estuaries created based on area to ensure that sites were selected in the smaller polygons

NCCA Really Worked for SC!

- SC estuary design developed with Tony Olsen's help around 1999
- EPA (Tony Olsen) aware of and understands the State program
  - The SC sample frame was used for the area of the draw
  - So we could use a sub-set of our monthly sites to replace the NARS sites
- SCDHEC could field a trained crew from the central office, so sample collection didn't impact the Regional staff (much)
- We already have partnerships in place with SCDNR and NOAA

Side Benefits of NARS to States

- Tech Transfer
  - In SC, we can now do our own draw of sites for three resource types to suit our design and needs
  - And compute the final statistics!
- NARS draws now include enough additional sites for States to incorporate a state-scale survey

When It Can Work

- EPA aware of **and understands** the State program
  - And both State and national questions can be addressed by the State design

Why NARS design may not work for States

- Different sample frame
- Different population of interest
- Different timing
  - Rotating basin vs. statewide
  - Draw may not be available in time for a State to incorporate a state-scale implementation
    - Time for adequate repeat visits
    - Time to address different index periods

Why NARS design may not work for States

- Some indicators have no standards, so the data don't fit State needs
- Supplemental & Research indicators – ditto
- Methods don't agree with State programs, so State's don't trust the results
  - We know our State better and have developed appropriate approaches
- Cutpoints used may not make sense in some areas, or may differ from State standards
- SC didn't use any of the NARS data that didn't comply with State methods

Concerns With NARS Indicators

- Some have no standards, so the data don't fit State needs
- Supplemental & Research indicators – ditto
- Methods don't agree with State programs, so State's don't trust the results
  - We know our State better and have developed appropriate approaches
- Cutpoints applied nationally may not make sense in some areas, or may differ from State standards

Concerns With Limited Data

- A single visit usually doesn't supply enough data to conform with State §303(d) assessment and listing methods

Organizational Constraints

- In SC monitoring staff are distributed in multiple field offices
- These Regional staff collect almost all the water samples
- Staff resources and time are limited
- So to add a state-scale statistically-valid survey component, the data should contribute to other program needs beyond §305(b)

Resources & Logistics

- In some states monitoring staff are distributed in multiple field offices
  - So not enough specialized equipment for each office to implement NARS indicators
  - Not enough training for each office
- Different waterbody type each year requires re-training every year
  - Loss of experience and interest in implementing "research methods" into state program

Resources & Logistics

- Staff resources already dwindling and low
  - So it's often a choice between meeting State program needs or collecting data that may not satisfy reporting needs

Resources & Logistics

- During reconnaissance the land owner says OK, but when you show up to sample they've changed their mind
- Sample processing time after collection (e.g. filtering)
- Finding an express shipping office that's open at the end of the day

Resources & Logistics

- And the paperwork…..
  - In the field
  - Before shipping
  - When the data are submitted
- And QA people constantly calling….
  - To ask where the data are
  - When will it be done
  - Where's all the associated QA records

MAP Design Subcommittee Recommendations

- The national survey design for an aquatic resource should be developed from state designs
  - State designs will either be a generic design for 50 sites
  - Or a state specific design requested by the state
  - State specific designs will need to meet some criteria consistent with national questions

MAP Design Subcommittee Recommendations

- Current NARS strategy of rotating surveys through the aquatic resource types should be retained until a detailed plan for monitoring all aquatic resources every year is available
  - The strategy would need to address policy/funding, operational and scientific issues

MAP Design Subcommittee Recommendations

- National or state assessments could be based on up to five years of data
  - For example, a national lake assessment for 2012 could be based on state data from 2008-2012

That's All Folks!

Any Questions?
Discussion?